DOCUMENT RESUME

ED 268 114 SP 027 470

AUTHOR Gliessman, David H.
TITLE Laboratory Methods in Teacher Training: Rationale and Use.
PUB DATE Mar 86
NOTE 18p.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Field Experience Programs; Higher Education; *Preservice Teacher Education; Teaching Experience; *Teaching Skills; *Training Methods

ABSTRACT

In this literature review, the research on training methods in teacher education is examined and the major variables that have been shown to influence the development of teaching skills are identified. The position is taken that, of these variables, those that address conceptual outcomes are most important. The implications of these variables for training are developed under the concept of laboratory methods; examples of laboratory methods in training are provided. Evidence of the effects of laboratory methods on skill acquisition is summarized and the place of laboratory based training in the teacher education program is suggested. (Author/CB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED268114

Laboratory Methods in Teacher Training: Rationale and Use.

David H. Gliessman

Indiana University
Bloomington

Prepared for the Coalition
of Teacher Education Programs

March 1986

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

D. H. Gliessman

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

SP027 470

In a recent paper, Berliner (1984) comments on the contradiction between the signs of dilution in teacher education programs and the evidence of an expanding knowledge base on teacher effectiveness. "For the first time," he writes, "teacher education has a scientific foundation. But now that we are capable of monumental reform in teacher education - reform guided by research - we hear only calls for the reduction or total elimination of teacher preparation programs" (p.94). Gage (1984) and Smith (1985) similarly call attention to the substantive knowledge that connects teaching and pupil learning, knowledge that promises to build an empirical base for teacher education.

The contradiction noted by Berliner is compounded when one considers also the state of the knowledge about teacher training. During the past twenty years, there has been a small explosion of studies of the training process. While the quality of these studies is uneven, together they provide a body of evidence that makes possible some hypotheses about the requirements for effective training as well as the testing of some conventional wisdoms about "the way to train teachers." The most precarious of these wisdoms has proven to be that teaching "really is learned" in the hard school of classroom experience.

The purpose of the present paper is to identify the major findings that can be drawn from the research on teacher training and to trace the implications of these findings for the conduct of training. As we shall see, these implications point rather directly to the use of laboratory methods as a central element in teacher training. While the meaning of "laboratory methods" hopefully will become clear in the ensuing pages, it is worth noting at this point that the term "laboratory" itself is

taken to refer to a setting in which simplified conditions make it possible to exercise control over key variables and to reduce the intrusion of unwanted sources of variation.

Another term that will be used throughout this paper requires more immediate attention. The term "training" should signal that our concern is with the development of the skills of teaching rather than more general knowledge about teaching and its content. The skills of teaching, however, should be construed quite broadly; they comprise the interpretive and performance skills that Broudy (1972) includes under the "technical proficiencies" of teaching. He means to include among these proficiencies, by way of illustration, knowledge about and competence in "---test construction, selection of materials, class management, the techniques of teaching---" (p. 63). Such proficiencies, he points out, reflect the application of theory rather than its construction or elaboration. The research on teacher training has largely focused upon teaching skills, those interactive skills that would be included under class management and teaching techniques in the above illustration; it has attended far less to planning skills such as material selection or evaluation skills such as test interpretation. In considering the results of the research, this is an important although far from restrictive limitation to keep in mind. Ultimately, classroom teaching skills are the defining skills of teaching as a process; furthermore, the central findings of the research on changing teaching skills appear to be applicable to planning and evaluation skills as well.

Research Base in Teacher Training

What do we know about the development of teaching skills? Rather

surprisingly, the most definitive answers to this question do not come from studies of field experience, student teaching or other conventional components of the teacher education program. Investigators who have focused upon these areas have shown little interest in changes in teaching skills; rather, studies in these areas concentrate largely on attitudinal changes, socialization effects, and similar social and emotional factors. The reasons for this neglect of skill acquisition are not entirely clear; one interesting possibility has been raised, however, by two reviewers of the research on field experience and student teaching: Eliott (1978) and Zeichner (1980) both suggest that the impact of practical experience on teaching performance has seemed so self-evident that investigators have simply not seen fit to question it. It seems that a certain "mythology" has developed about the value of "direct experience" in teacher training; the major myth is that one learns to teach through experience and perhaps only through experience. The commitment to this myth--it is really an untested assumption--is reflected in the fact that some kind of practical experience is the only aspect of teacher education that has not at some point been called into question.

Our most useful knowledge about the development of teaching skills comes instead from studies in which investigators have looked at the direct or comparative effects of the use of specific training techniques and materials on skill acquisition. These studies have been conducted in laboratory and classroom settings with inexperienced and experienced teachers. Some have been simple pre-post studies, others have been experimental in design. The techniques that have been of interest to investigators include microteaching, minicourses and observational

training; the materials that have been of interest include protocols of classrooms and simulated practice exercises. The skills addressed in these studies include questioning, the use of indirect influence, verbal structuring and behavior management skills. Change in performance has generally been indicated by increases in the frequency of skill use. In this mélange of techniques and materials, however, one can identify a limited set of variables that appear to account for change in performance (Gliessman, 1981, 1984).

The key training variables can be sorted into two general categories: instructional variables and intervention variables. Instructional variables are designed to teach the trainee about specific teaching skills or proficiencies through explication and demonstration. Skills are defined and often elaborated upon through oral presentation, printed manuals, and other verbal means. These steps typically are supplemented by the presentation of examples or models through the use of film, videotape, audiotape and occasionally print. Intervention variables are those training techniques designed to influence directly the present behavior of the trainee. These techniques often entail the provision of delayed feedback on the trainee's teaching performance by means of videotape or audiotape recording and sometimes involve the planned use of positive reinforcers and reinforcement schedules.

While instructional and intervention variables each have been used successfully in training studies, however, evidence strongly suggests that conceptual and observational variables underlying both account for the major portion of change in teaching skills. To put it another way, it is the conceptual and observational processes of the trainee that

appear to mediate change in performance no matter what techniques or materials are used. Trainees appear to learn skills as concepts and to experience changes in concepts and conceptual structures as skills are developed and refined. Lest these generalizations seem banal, it should be noted that they imply quite different learning processes than those assumed by most teacher educators and many researchers: That teaching skills are learned much as are physical skills through repeated and extended practice. In fact, it appears to be what the trainee brings to and takes from practice conceptually that is the critical aspect of training.

While the cognitive view of change in performance has been argued by a number of theorists (e.g., MacLeod and McIntyre, 1977; Griffiths, 1977; Wagner, 1973), the present writer and his colleagues found quite strong evidence that conceptual and observational processes were more important in the acquisition of one generic teaching skill--questioning--than were processes associated with rehearsal or practice (Gliessman, Pugh, Dowden, and Hutchins, 1985). In the training studies reviewed, it was clear that the presence and the extensiveness of practice added very little to the effects of conceptual and observational instruction in the acquisition of a teaching skill.

Laboratory Methods in Teacher Training

The task of the trainer is to manage the above variables in a way that assures mastery of a prescribed set of teaching skills, both interpretive and performance skills. Developing the questioning skill of "probing", for example, would appear to require training in knowing both when and how to probe. The trainer will want, first, to sensitize

the trainee to pupil reactions--for example, confused or incomplete answers to questions--that signal the need for probing. The trainer needs next to define and illustrate probing as a form of questioning; contrast it with such forms of questioning as rhetorical or initiatory questioning; place probing in the context of other verbal techniques intended to extend pupil thinking. He may finally wish to provide explicit feedback on the trainee's use of probing during a microteaching or peer teaching session.

Training sequences such as the foregoing require a level of control that is not achievable in the school classroom. They depend also upon a blending of technique and technology that is not characteristic of, and may even be inappropriate for, the lecture hall. The setting implied by such sequencing of tasks is more nearly that of a laboratory. In any laboratory, materials and technologies are brought together in order to study selected phenomena; in a teacher training laboratory, the phenomena studied are pupil and teacher behavior. The objective of this study is both the development of skills and an increment in systematic knowledge about effective training. This conception of laboratory training is, of course, not new. It is quite similar to a plan outlined well over a decade ago by Smith (1969) in his seminal book, Teachers for the Real World. In this volume, Smith described two components that make up the core of teacher training: The development of interpretive skills to be accomplished through the use of psychological, sociological and other concepts to describe and interpret classroom behavior; the development of performance skills through the videotaping and analysis of actual teaching behavior in simplified teaching settings. In essence, Smith

specified the need for control of training through the use of new kinds of materials and technologies.

In the years since Smith made his proposals (and after some qualified success in creating both protocol and training materials), two developments have taken place that might well suggest a reconsideration of his argument. First, as has been indicated, knowledge about both teaching and teacher training has grown significantly. While knowledge about what constitutes effective teaching is far less than substantial, it is also far less tentative than when Teachers for the Real World was published. While Smith had to use a poorly validated set of "technical teaching skills" as examples of training objectives (pp. 73-75), we can now speak with greater confidence of such skills as direct teaching, clarity of communication, maintaining on-task behavior, monitoring for appropriate and inappropriate behavior, and questioning at different levels of complexity as skills that have demonstrated connections with pupil learning. At the same time, our knowledge about training supports much of what Smith assumed on the basis of the more limited evidence available at the time he wrote. The present evidence supports particularly the emphasis he placed upon acquiring clear concepts to describe the behavior of pupils and teachers.

A second significant development of the past decade is the continued advance that has been made in the technology of training, especially in the application of computer control. To take one general example, microcomputer control of videotape and videodisc provides rapid and flexible access to examples of teaching skills, pupil behaviors and behavioral events that have been recorded in classrooms and other "real life"

settings. This means that a "generic" protocol or documentary can serve as a source of examples for a large number of concepts. Such flexible accessing would have been "tailor made" for the study of protocols that Smith envisioned; unfortunately, the technology of that time could not provide for it.

The advances in training made possible by the computer and other technologies perhaps can be best appreciated by considering a few concrete examples. While those described were undertaken at Indiana University, examples could be cited from other institutions including Stanford University, Far West Laboratory, and Utah State University. In describing our own, the present writer has at least the advantage of direct familiarity. The first two examples illustrate the use of computer control; the second two, the use of specially designed films.

Learning to interpret pupil behavior. In the area of interpretive skill, L. D. Brown is presently developing a microcomputer-controlled videotape program designed to help trainees learn to interpret pupil behavior in terms of a set of social-psychological concepts. Computer control enables the trainer to display selected excerpts of classroom scenes from different parts of a "bank" of film recording. Feedback on accuracy or appropriateness in using social-psychological terms to describe pupil behavior is provided the trainee at specific points. Ultimately, this program will be committed to videodisc for more rapid accessing of scenes.

Skill training through continuous feedback. An interesting intervention technique designed to modify ongoing teaching behavior was attempted by researcher/developers working in the area of special education

in our own institution. This technique entailed providing teacher trainees with continuous feedback on their use of questioning, feedback, reinforcing and similar skills with pupils in a small classroom group; feedback was presented in the form of summating "tallies" on a video screen that was visible to the trainee during teaching. This intervention resulted in a significant increase in the use of the targeted skills (Semmel, 1976).

Acquiring a teaching skill through film-based training. Questioning skills were displayed on film as exhibited by teachers at different grade levels. The target skills were sharply "cued" in some films, uncued in others. As a result of training based upon these films, experienced teachers have shown significant change in frequency of using the targeted questioning skills; furthermore, level of mastery exhibited by the trainees in accurately identifying the skills was positively and significantly correlated with frequency of using the same skills in the teaching setting (Gliessman, Pugh & Bielat, 1979).

Perceptual training in classroom monitoring. At a more complex skill level in the area of class management, G. M. Ingersoll developed a film series designed to increase teacher trainees' effectiveness in monitoring a classroom for signs of offtask and deviant behavior. Provided with a set of simple behavior categories, trainees were provided practice in simultaneously scanning pupil activity in two groups (shown by means of a split-screen technique). Training resulted in significant shifts toward a more accurate pattern of quickly and appropriately categorizing pupil behavior as it was shown on film (Ingersoll & Gliessman, 1980).

These innovations might better be viewed as pilot efforts than as prototypes; the latter term suggests a stage of development that is advanced rather than exploratory. And the above innovations reflect quite well the exploratory state of the newer technologies in teacher training. But progress could be rapid with an expanded and focused development effort in teacher education. The obstacles to such an effort are familiar enough: development is an ambitious user of time; it draws upon varied technical skills (in substantive areas, technology, media production and evaluation); it depends upon access to typically expensive technical equipment; it assumes development experience and skills that are not common among teacher educators. It is true, too, that development work is accorded little recognition in the promotion and merit decisions of many universities. Overcoming these obstacles is a worthwhile undertaking only if the case for laboratory methods is sufficiently strong. Let us strengthen the case by looking at the empirical evidence.

Effects of Laboratory Methods

The case for laboratory methods of training has been constructed thus far on an indirect basis: Identifying the requirements of training in light of what is known about the variables that influence the development of teaching skills. Is there direct evidence on the effectiveness of laboratory-based training? In the previously cited review of the research on skill training (Gliessman et. al., 1985) a comparison was made of the effects of training in a generic teaching skill when that training was conducted in three settings: Laboratory (generally in a college or university facility); special school setting (in a specially

arranged classroom setting within a school); normal classroom setting within a school. It was predicted that training would increase in effectiveness as the setting became more controlled, in other words from the normal classroom setting to the laboratory. This prediction was partially supported. In those studies that were experimental in design, training was significantly more effective, in terms of skill acquisition, when conducted in a laboratory setting than when conducted in the normal school classroom setting. Furthermore, the trend in effectiveness was in the direction predicted, increasing from classroom setting to special school setting to laboratory setting.

Do the skills acquired in a laboratory setting survive the transition to the classroom? Critics of laboratory training have contended that skills acquired in such a simplified setting are likely to "wash out" in the complexity of the classroom. Research on this issue is equivocal, some demonstrating the direct transfer of skills to the classroom (e.g., Emmer, 1971), more calling such transfer into question (e.g., Peterson, 1973; Copeland, 1975). Because of the criticality of the issue, it also was addressed in the previously cited review. A subset of experimental studies was selected in which training was conducted in the laboratory but in part of which skill acquisition was assessed in the classroom rather than the laboratory. If the transfer of skills to the classroom is an uncertain matter, one would predict a higher incidence of skill use in the laboratory than in the classroom. In fact, there was no significant difference; there was no evidence in the thirteen studies to indicate that skills acquired in the laboratory setting

were less frequently used in the classroom than in the laboratory setting.

Even this evidence does not settle the matter. To demonstrate that a skill or proficiency acquired in the laboratory can be used in the school classroom is not the same as demonstrating that it will be used in the classroom during the normal course of teaching. The continued use of a skill appears to be conditioned by a number of influences certain of which are related to the training process. The choice and treatment of the skills to be emphasized may help to determine their use or lack of use in the classroom. It has been demonstrated with practicing teachers, for example, that recommended practices that appear to teachers to be practical and useable as well as acceptable in terms of personal values are more likely to be adopted in the classroom. Practices that are complicated, difficult to introduce in the classroom and without a clear rationale are less likely to be adopted. The clarity and simplicity with which skills are described also influences the likelihood of adoption (Mohlman, Coladarci and Gage, 1982; Needels, 1980).

Implied in the above findings is the hypothesis that more clearly and completely understood skills are more likely to become a functioning part of the trainee's teaching repertoire. Smith (1985) makes a similar point in contending that teachers cannot be expected to infer the skills implied by the theory and research that connects teaching and learning. The skills implied by theory and research ought to be stated explicitly enough that they can serve as direct guides to action. One has the impression that our disappointment in failing to see trainees demonstrate the skills and practices that we recommend can be traced

back substantially to the fuzziness and vagueness with which we treat those skills and practices in the first place.

A second set of influences on the use of acquired skills can be found within the classroom teaching setting itself. In a series of studies, Copeland (1977, 1980) demonstrated that the frequency with which an acquired skill is used in the classroom depends in part on the indirect support for that skill (through counseling and modeling) provided by the trainee's cooperating teacher. Even more important were the kinds of learning activities that had been established in the classroom by the cooperating teacher; when the "activity structure" of the classroom was open to the use of a skill, primarily because the teacher had established it, that skill was more likely to be used by the trainee. It appears, then, that the indirect influence and activity support provided by a cooperating teacher is of importance in assuring that an acquired skill will remain functional in the classroom.

Our experience in our own research is that skills are more difficult for preservice trainees to acquire than they are for experienced teachers. Evidence reported in our review of the research on training suggests that our experience in this respect is not an isolated one. In the studies reviewed, there was some degree of support for the hypothesis that the effect of training would be greater for experienced, graduate level teachers than for inexperienced, undergraduate trainees. A prevailing impression is that the classroom behavior of inexperienced, preservice trainees is so uneven and unstable that is provides an undependable "anchorage" for newly acquired skills. In that event, the influence of the cooperating teacher becomes critical in helping to

maintain newly acquired skills until the trainee's general behavior becomes stabilized.

The Training Program

The above observations about the transition from laboratory to classroom suggest, in broad outline, the place of laboratory methods within the larger training sequence. Broudy in The Real World of the Public School identified three training settings that, in sequence, he felt were necessary for the development of technical proficiency: laboratory, clinic and internship. This sequence carries through the logic of laboratory-based training. While Broudy does not say this, one can see in his sequence two progressions: (1.) Decreasing control by the trainer over the variables of training and (2.) increasing control by the trainee of her own performance. In the first progression, the trainer begins with a high degree of control over instructional stimuli and intervention strategies in the laboratory setting. This is a time when a clear understanding must be established of the skills and proficiencies that are deemed important. In the clinical setting, control is still exercised by the trainer working carefully with the trainee in the diagnosis, instruction and evaluation of individual students. But the clinical setting makes demands of its own: Individual students may not act as predicted and may seldom display the clusters of symptoms or abilities that can be so conveniently simulated in the laboratory setting. This unpredictability necessarily (and desirably) loosens the degree of control that the trainer can exercise. At the same time, the trainee is beginning to assume direct control of her own planning, instruction and evaluation. In the intern setting, with the trainee handling a number

of students on a prolonged basis, the degree of unpredictability is even higher. While the trainer still must function as mentor and monitor, synthesizing the skills of planning, instructing and evaluating becomes in large part the task of the trainee herself.

References

Berliner, D.C. (1984) Making the right changes in teacher education. Phi Delta Kappan, 66, 94-96.

Broudy, H.S. (1972) The real world of the public schools. New York: Harcourt Brace Jovanovich.

Copeland, W.D. (1975) The relationship between microteaching and student teacher classroom performance. Journal of Educational Research, 68, 289-93.

Copeland, W.D. (1977) Some factors related to student teacher classroom performance following microteaching training. American Educational Research Journal, 14, 147-157.

Copeland, W.D. (1980) Student teachers and cooperating teachers: An ecological relationship. Theory Into Practice, 18, 194-199.

Elliott, P.G. (1978) Field experiences in preservice teacher education. Bibliographies on Educational Topics (No. 9). Washington, DC: ERIC Clearinghouse on Teacher Education.

Emmer, E.T. (1971) Transfer of instructional behavior and performance acquired in simulated teaching. Journal of Educational Research, 65, 178-182.

Gage, N.L. (1984) What do we know about teaching effectiveness? Phi Delta Kappan, 66, 87-93.

Gliessman, D.H. (1981) Learning how to teach: Processes, effects and criteria. Washington, DC: ERIC Clearinghouse on Teacher Education.

Gliessman, D.H. (1984) Changing teaching performance. In L. Katz & J. Raths (Eds.) Advances in teacher education (Volume 1). Norwood, NJ: Ablex.

Gliessman, D.H., Pugh, R.C. & Bielat, B. (1979) Acquiring teaching skills through concept-based training. Journal of Educational Research, 72, 149-154.

Gliessman, D.H., Pugh, R.C., Dowden, D.E. & Hutchins, T.F. (1985) Variables influencing the development of a generic teaching skill: A research synthesis. Revision of a paper presented at the Annual Meeting of the American Educational Research Association, Chicago.

Griffiths, R. (1977) The emergence of a cognitive perspective in micro-teaching. Educational Studies, 3(3), 191-197.

Ingersoll, G.M. & Gliessman, D.H. (1980) Increasing the accuracy of monitoring classroom behavior. Bloomington, IN: Center for Development in Teacher Education,. Indiana University.

MacLeod, G. & McIntyre, D. (1977) Towards a model for microteaching. British Journal of Teacher Education, 3, 111-120.

Mohlman, G., Coladarci, T. & Gage, N.L. (1982) Comprehension and attitude as predictors of implementation of teacher training. Journal of Teacher Education, 33 (1), 31-36.

Needels, M. (1980) Directed teacher change. Paper presented at the Annual Meeting of the American Educational Research Association, Boston.

Peterson, T.L. (1973) Microteaching in the preservice education of teachers: Time for a reexamination. Journal of Educational Research, 67, 34-36.

Semmel, M.I. (1976) The effects of CATTS feedback in a preservice special education teacher training program. Bloomington, IN: Center for Innovation in Teaching the Handicapped, Indiana University.

Smith, B.O. (1969) Teachers for the real world. Washington, DC: American Association of Colleges for Teacher Education.

Smith, B.O. (1985) Research bases for teacher education. Phi Delta Kappan, 66, 685-690.

Wagner, A.C. (1973) Changing teaching behavior: A comparison of micro-teaching and cognitive discrimination training. Journal of Educational Psychology, 64, 299-305.

Zeichner, K.M. (1980) Myths and realities: Field-based experiences in preservice teacher education. Journal of Teacher Education, 31(6), 45-55.